

## CHAPTER 4 TESTING OF POWERPLANTS AFTER OVERHAUL

### Section 1 Background

1. This chapter provides guidance to ensure that powerplant overhaul facilities accomplish the testing of powerplants after overhaul per the maintenance procedures recommended by the engine manufacturer.

A. Powerplant manufacturers are very specific in their recommended procedures for powerplant testing after overhaul. This testing is required to run-in new parts, check powerplant performance, and check the quality of the work performed during overhaul. The procedures to be followed in overhaul testing of a powerplant vary by make and model, but are clearly outlined in the manufacturer's manual.

B. FAR § 43.13 requires that each person performing maintenance must use methods, techniques, and practices acceptable to the Administrator. If special equipment or test apparatus is recommended by the powerplant manufacturer, that equipment or apparatus or an equivalent acceptable to the Administrator must be used.

C. *Certificated Repair Stations.* FAR § 145.57(a) states that FAR § 43.13 also applies to certificated repair stations. In addition, FAR Part 145, Appendix A(b)(1)(v) requires repair stations to have the equipment required to test overhauled powerplants in compliance with the manufacturer's recommendations or an equivalent method acceptable to the Administrator. The testing may be performed by the repair station itself or may be contracted to an outside certificated agency. In either case, the repair station will be responsible for the final acceptance of the tested engine as the repair station is the final approving authority for return to service.

D. A powerplant overhaul agency that requests another agency to perform the overhaul testing should have established procedures for that testing. The procedures should show the following:

(1) The agency that is to perform the test has the information necessary to complete the test properly

(2) The powerplant records will include the statements required by FAR § 145.59

(3) That until the required test procedures have been completed by a person authorized by FAR § 43.7, the powerplant has not been tested and is not considered airworthy

(4) The person authorized by FAR § 43.7 is responsible for the final acceptance of the tested powerplant

#### E. *Powerplant Overhaul Testing Environment*

(1) *Turbine engine testing.* Since the performance of a turbine engine is greatly affected by the surrounding atmospheric conditions, most turbine engine manufacturers recommend that powerplant testing after overhaul be accomplished in the controlled conditions of a test facility/cell equipped as outlined in the manufacturer's overhaul manual.

(2) *Reciprocating engine testing.* The manufacturers of reciprocating engines allow the airframe to be considered a suitable test stand for the running-in of overhauled engines, provided the following requirements are observed:

- A test club is used in place of a flight propeller
- A suitable cooling shroud or scoop is used to gather and direct cooling air over the cylinders
- A cylinder head temperature pickup is installed on each cylinder to monitor individual cylinder temperature
- All necessary calibrated gauges are installed independent of the aircraft gauges

(3) When other methods for testing come to the attention of Aviation Safety Inspectors (ASIs), the methods should be

evaluated to determine if they are equivalent to the above requirements. When noncompliance with FAR § 43.13 is evident, corrective action must be initiated to correct any discrepancies.

**NOTE: When performing an engine overhaul, especially if it includes any kind of engine modification, all of the work must be accomplished in accordance with approved data.**